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## PATENT SPECIFICATION

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## DRAWINGS ATTACHED

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## (54) DASHBOARD ASSEMBLIES FOR VEHICLES

- (71) We, JOSEPH LUCAS (INDUSTRIES) LIMITED, a British Company, of Great King Street, Birmingham 19, do hereby declare the invention for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- This invention relates to dashboard assemblies for vehicles.
- 10 A dashboard assembly according to the invention includes an instrument support panel, an instrument supported by said panel and extending through a hole in said panel, cooperating retaining means on said panel and said instrument operable by rotation of said instrument relative to said panel to secure said instrument to said panel, a printed circuit board, spaced from but generally parallel with the panel, an arcuate contact member carried by said printed circuit board and electrically connected to a conductor of the printed circuit, and a terminal member on said instrument, said terminal member engaging said contact member so as to make an electrical connection between said instrument and said printed circuit conductor, and said arcuate contact member lying along an arc described by said terminal member during rotation of said instrument relative to said panel so that the electrical connection between the instrument and the printed circuit conductor is maintained during said rotation of the instrument.
- The term printed circuit board is used herein to mean a rigid printed circuit, or a flexible printed circuit supported on a rigid base.
- One example of the invention is illustrated in the accompanying drawings, wherein
- Figure 1 is a diagrammatic representation of a dashboard assembly,
- 40 Figure 2 is an enlarged perspective view of the contact arrangement shown in Figure 1, and
- Figure 3 is a fragmentary perspective view of part of the support panel shown in Figure 1.
- Referring to the drawings, the dashboard assembly includes an instrument support panel 11 which is secured to the body of the road vehicle, in a position where it is visible to the driver of the vehicle. The support panel 11 is formed with an aperture 12 within which is engaged an instrument 13, for example, a tachometer. The instrument 13 has a cylindrical casing, which is formed at its forward end with an outwardly directed peripheral flange 14. The instrument 13 is inserted through the aperture 12, and a rubber sealing ring 15 is trapped between the panel 11 and the flange 14 of the instrument. The casing of the instrument includes a pair of outwardly directed, diametrically opposite posts 16 which pass through corresponding slots 17 in the wall of the aperture 12 when the instrument is inserted through the aperture 12. Adjacent the slots 17, the rear surface of the panel 11 is formed with a pair of ramps 18, the lower ends of the ramps 18 being adjacent their respective slots 17. At the high ends of the ramps 18 remote from their respective slots 17, the rear surface of the panel 11 is formed with a pair of radially extending grooves 19 the walls of which define a pair of shoulders 21. In order to secure the instrument 13 to the panel 11, the instrument 13 is inserted through the aperture 12 until the flange 14 of the instrument 13 traps the rubber sealing ring 15 against the panel 11, the instrument 13 is then rotated relative to the panel 11 so that the posts 16 on the casing of the instrument ride up the ramp surfaces 18 thereby moving the instrument 13 axially relative to the panel 11 and compressing the sealing ring 15. The instrument 13 is rotated until the posts 16 ride off the respective ramp surfaces 18, and locate between the shoulders 21 of the respective grooves 19, whereupon the instrument 13 is secured in position relative to the panel 11 by engagement of the posts 16 in the grooves 19. The rise of the ramp surfaces 18 is greater than the depth of the grooves 19 so that when the posts 16 engage in the grooves 19 the sealing ring 15 is still compressed.
- A printed circuit board 22 is supported by the panel 11, and is positioned behind the panel parallel with the panel. The printed circuit

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board 22 is spaced from the panel 11, and the required electrical connections to the instrument 13 are made through the conductors of the printed circuit board 22. In order to make the necessary electrical connections between the printed circuit board 22 and the instrument 13, the instrument 13 is provided with a pair of terminal pins 23 which extend towards the board 22, and the board 22 is provided with a pair of arcuate channel shaped conductive members 24, within which the pins 23 are received. The conductive members 24 are of channel shaped cross-section, the limbs of the channel being resilient, and being formed at their free ends with longitudinally extending inwardly directed ribs 25. The members 24 are arcuate, and are received in corresponding arcuate holes in the board 22, the members 24 being inserted through the holes in the board 22 from the side of the board 22 remote from the instrument 13, and being provided with tags 26 which are flexed inwardly as the members 24 are inserted through the holes in the board, and which snap outwardly when the members 24 are in position, to engage the surface of the board 22 adjacent the instrument 13. The members 24 further include outwardly extending tongues 27 which engage the surface of the board 22 remote from the instrument 13, so that the members 24 are held against movement relative to the board 22 by tags 26 and the tongues 27. The spacing of the tags 26 from the tongues 27 is such that when the members 24 are engaged with the board 22, then the tags 26 are stressed and bite into the surface of the board 22, so as to make a good electrical connection to the conductors of the board 22.

The members 24 are positioned on the board 22 so that they lie along the arcuate paths described by the pins 23 when the instrument 13 is rotated relative to the panel 11, to secure the instrument 13 to the panel. Thus, when the instrument 13 is initially inserted through the hole 12 in the panel 11, the pins 23 enter their respective conductive members 24 so that the required electrical connections are made between the board 22 and the instrument 13, and when the instrument 13 is subsequently rotated relative to the panel 11, then the pins 23 ride along the arcuate conductive members 24 so that the required connections to the instrument

13 are maintained throughout the range of movement of the instrument relative to the panel 11. The dimensions of the pins 23 and the members 24 are such that the members 24 grip the pins 23, and thereby ensure that a good electrical connection is produced between the pins 23 and the members 24.

The provision of the arcuate members 24 ensures that the required electrical connections are made to the instrument 13 even in the event that inaccuracies arise in the positioning of the parts of the assembly relative to one another owing to tolerance build-up in the manufacture of the parts.

## WHAT WE CLAIM IS:—

1. A dashboard assembly, for a vehicle, including an instrument support panel, an instrument supported by said panel and extending through a hole in said panel, co-operating retaining means on said panel and said instrument operable by rotation of said instrument relative to said panel to secure said instrument to said panel, a printed circuit board, spaced from but generally parallel with the panel, an arcuate contact member carried by said printed circuit board and electrically connected to a conductor of the printed circuit, and a terminal member on said instrument, said terminal member engaging said contact member so as to make an electrical connection between said instrument and said printed circuit conductor, and said arcuate contact member lying along an arc described by said terminal member during rotation of said instrument relative to said panel so that the electrical connection between the instrument and the printed circuit conductor is maintained during said rotation of the instrument.

2. An assembly as claimed in claim 1 wherein said arcuate contact member includes a pair of generally parallel, arcuate, resilient limbs, and said terminal member is in the form of a conductive post, said terminal member being gripped between said limbs of the contact member.

3. A dashboard assembly, for a vehicle, comprising the combination and arrangement of parts substantially as described with reference to the accompanying drawings.

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1255791 COMPLETE SPECIFICATION

1 SHEET This drawing is a reproduction of  
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